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# U. S. DEPARTMENT OF AGRICULTURE

FARMERS' BULLETIN No. 1370

# DAHLIAS *for the* HOME

NO FLOWER is more important in the garden during the late summer and autumn than the dahlia. Its needs are simple and its returns many and generous. If grown in a situation open to sunlight and fresh air but not swept by winds and if provided with a well-worked fertile soil, neither overwatered nor parched, the dahlia will provide an abundance of beautiful blooms for cutting or garden display.

The forms and color variations of the flowers furnish so great a range that almost any personal taste or fancy can be gratified.

Dahlias are obtained from nurseries as dormant roots or as growing plants which have been raised from cuttings. Plants may be raised from seed, however. After the season's growth the plants are dug, the tops cut off, and the roots dried off and stored until the following spring in a dark, dry frost-proof cellar. They are then ready to be started into growth and divided into as many pieces as desired or as there are new shoots starting.

Washington, D. C. Issued November, 1923

# DAHLIAS FOR THE HOME.

By B. Y. Morrison, *Assistant Landscape Gardener, Office of Horticultural Investigations, Bureau of Plant Industry.*

CONTENTS.



## THE APPEAL OF THE DAHLIA.

THE DAHLIA is one of the flowers of the day which is so popular that a national society is devoted to its interests. So many are its admirers that it takes its place with the rose and the peony, the iris and the gladiolus, the sweet pea and the carnation, the chrysanthemum and the orchid.

From this list, which embraces most of the essential florists' flowers, it is evident that the dahlia must have qualities which appeal to many sorts of flower lovers. To the commercial grower the dahlia is of importance in providing an abundant supply of flowers through the late summer and autumn in a large variety of colors and forms and of a substance and quality which make them "good shippers and keepers," in the parlance of the trade. To one who makes a garden for its effect as a whole the dahlia is of importance for its range of color, its freedom of bloom, and the dominating character of its appearance in the autumn garden. To the amateur with whom collecting is a hobby the dahlia offers a field of almost endless variety, for ever since these flowers were brought to garden notice in 1789 they have shown an amiable tendency to vary from seed into multitudinous colors and forms. To that amateur who takes pleasure in producing his own garden plants the dahlia proves an admirable subject for his care, as dahlias are easily raised from seed and come quickly to their flowering.

While the dahlia is preeminently a plant flourishing best along the coasts where the air is filled with moisture, it can be grown with entire success at a considerable distance inland if the grower is willing to take particular pains with the water supply of his plants. Careful watering, the extent of which can be determined best by experiment, will show just how much water will be required to keep the plants in vigorous but not sappy growth. With this must be considered the cooling influence of a deep mulch, whether supplied by cultivation or by outside materials. Remembering this, the gar-

dener even in the interior of the country should be able to produce dahlias of considerable merit, when the cooler nights of autumn assist his work, though for a shorter season and of less perfect development than if his garden were in a more favored locality. This handicap should be borne in mind, especially in purchasing from the catalogues of growers located in the best dahlia regions, for often the flowers from their plants when grown in less favorable situations fail to realize the mammoth size and remarkable colorings promised, simply for lack of an ideal location. There is one difficulty, however, which the gardener can not overcome, and for the man who lives in a Northern State where the frosts come early dahlias are scarcely worth the effort to bring them to early maturity, although it has been pointed out that they will grow wherever tomatoes will succeed. With this in mind, it is not difficult to see how a plant so easily cared for, in localities at all suited to its growth, should have come into such general popularity.

## INTRODUCTION TO CULTIVATION.

Dahlia history commences in 1791, when Cavanilles, the director of the Botanic Garden of Madrid, Spain, described in the first volume of his Icones the flowering of a set of dahlia roots (not seeds) received in 1789 from Vicente Cervantes, of Mexico. It has been reported for years that some of this shipment found its way directly to England through the hands of Lady Bute, wife of the British Ambassador to Spain, but it has recently been pointed out by careful historical research [1] that dahlias first reached England in 1798 through the agencies of a lady who should be known by her correct title, the Marchioness of Bute. This had little effect on the history of the plant, however, as all these plants perished from a lack of proper understanding of their needs. They were reintroduced successfully in 1804, through the interest of Lady Holland. On the Continent, the plants, both single and double varieties, flourished and in time were widely distributed from Madrid. In the garden of M. Donkelaar, director of the Botanic Garden of Louvain, some fine double forms appeared, which were the important beginnings of the double dahlias of later years.

It has recently been brought out [2] that while this importation was the introduction of the living plants to Europe, knowledge of their beauty and forms was reported as early as 1575 by Francisco Hernandez, the celebrated protomedico of Philip II. He described them as being cultivated in Mexico, cited local names for several forms, and in addition noted their range of colors and degrees of doubling. His descriptions, however, were not published until much later.

With this information it is easy to understand how seedlings raised in Europe from the original tubers showed immediate and considerable variations, the reason being that the original roots probably represented not only the variable species but garden or natural hybrids in addition.

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[1] Payne, C. Harmon. Gardener's Chronicle, v. 60, no. 1552, Sept. 23, 1916.
[2] Safford, W. E. Notes on genus Dahlia. Jour. Wash. Acad. Sci., v. 9, no. 13, July 19, 1919.

## TYPES.

From the beginning there appeared among the seedlings single forms (fig. 1), but greater interest centered about such variations as showed tendencies toward doubling. With M. Donkelaar's plants as a beginning, enthusiastic horticulturists carried the work to that standard of perfection which they valued at the time. In various forms and colorings the flowers became the show and fancy dahlias, some examples of which (fig. 2) are still in cultivation. They are not now so popular as in the days when their quilled petals, with

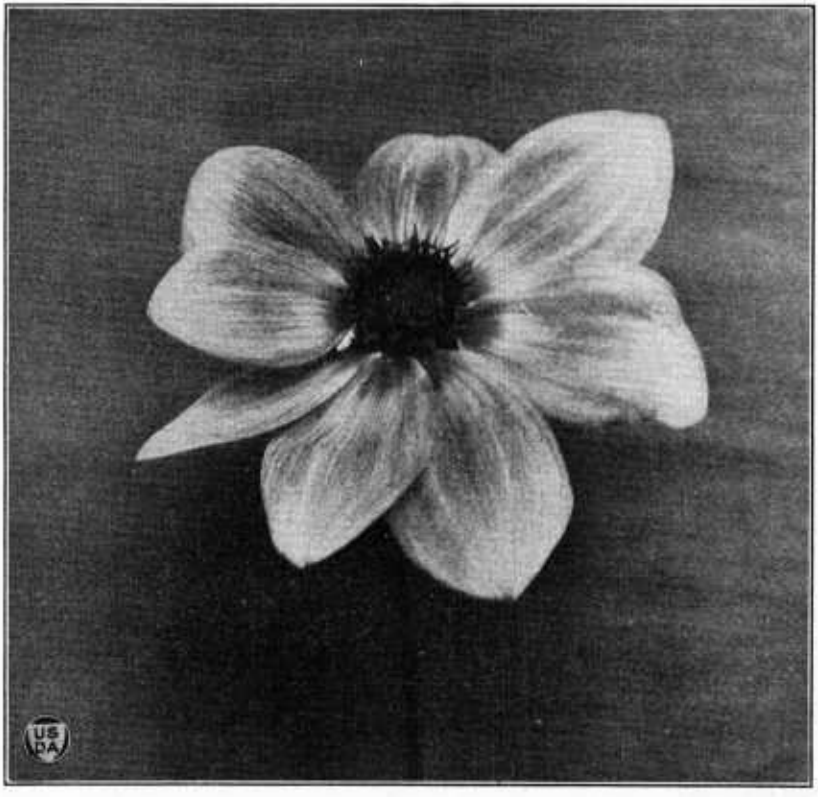

FIG. 1.—Seedling single dahlia.

their mechanical perfection of arrangement and form, offered a field for certain showmen who found pleasure in infinitesimal differences. These same characteristics, however, led to a waning of popularity, for people in general lost interest in these artificial waxlike blooms.

It was not until 1879, when the first cactus dahlia appeared, that the public once again took interest in the dahlia. The cactus dahlia (fig. 3), so called because the bloom of the first plant resembled the flower of the scarlet *Cereus speciosissimus*,[3] has petals which recurve at the margins and show as well a curious twisting or curling of the

[3] Now classified as *Heliocerus speciosus* Brit. and Rose.

entire petal. The free and fantastic forms of this flower revived interest in the whole family.

Much later there appeared what are now known as the decorative dahlias (fig. 4). These are flowers with large, broad petals arranged more or less loosely in rather flat heads.

Merging into this last group is the group of hybrid cactus dahlias (fig. 5) in which the petals do not show the extreme of reflexing characteristic of this type. Indeed, some have petals which are reflexed scarcely more than at the margins (fig. 6). They are flowers

FIG. 2.—Fancy dahlia, La Grand Manitou.

of great beauty and of greater commercial importance, as they ship better and hold their flowers more erect than the true cactus types.

Related at least by their artistic appearance are the peony-flowered dahlias (fig. 7). These are semidouble dahlias in which the center florets are twisted and curled so that the whole has the fluffy appearance of the peony bloom. These with the cactus and decorative types form the larger part of the varieties grown by the amateur gardener.

There are, however, various other types of dahlias. The original single type (fig. 1) has been maintained and developed with plain and

cactus types of petals in many colors and in greater size. Similar to them, but with a floriferous development of the stamens of the ray florets of contrasting color, are the collarette dahlias (fig. 8). The duplex dahlias are a group of flowers in which the center disk florets still show, as in the single forms, but they have several rows of ray florets. They have something of the grace of the single flowers and are more lasting and consequently more valuable. More


FIG. 3.—Cactus dahlia, Countess of Lonsdale.

recently has appeared the anemone-flowered dahlia (fig. 9), in which all the disk florets are partially transformed, as in an anemone-flowered chrysanthemum. These, together with such types as the pompon dahlias, which are merely dwarf forms similar to the tall-growing show dahlias (fig. 10), but with more spherical flowers, are the chief sorts to be met with, but each year brings its train of novelties, among which are often new strains perfected by some grower and possessing more or less distinction.

## PROPAGATION.

Dahlias are easily propagated. The amateur usually buys roots in the first place. These may be either dormant roots or young growing plants. He may, however, purchase seed and raise his own plants.

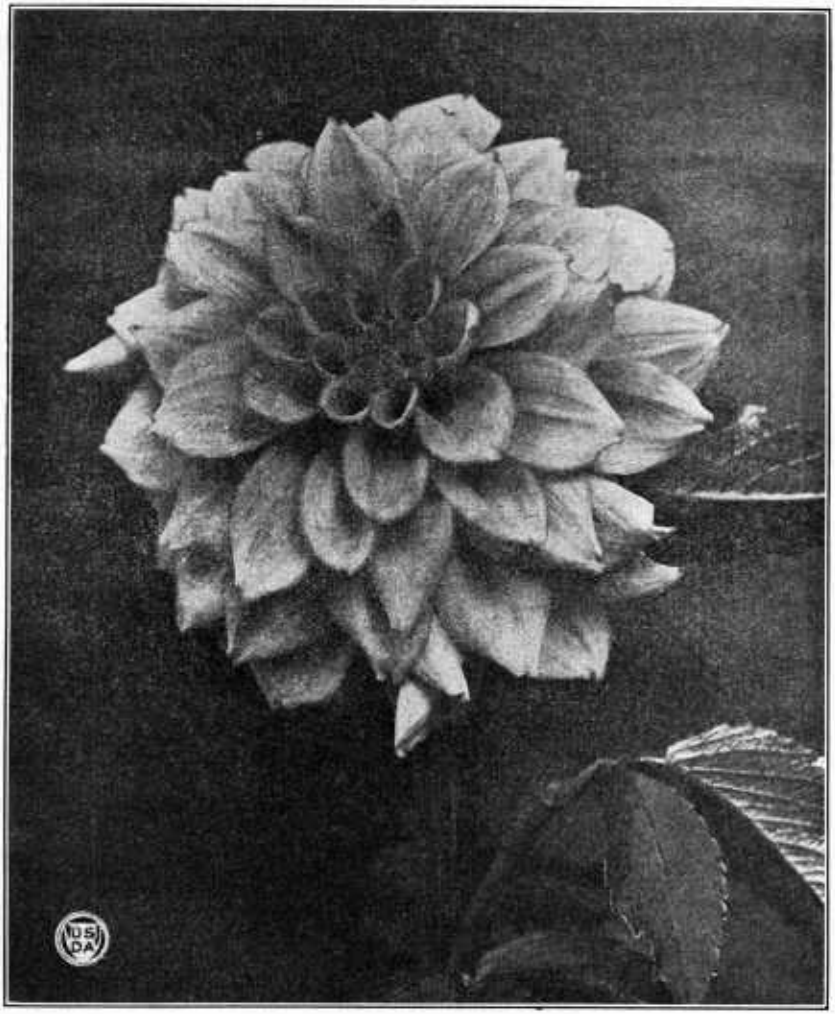

FIG. 4.—Decorative dahlia, Break o'Day.

### SEEDS.

Commonly dahlia seed is planted indoors several weeks before the time of the last killing frost, and the young seedlings are pricked off into pots when large enough to be handled and are transferred to their permanent quarters as soon as danger from frost is past. With good culture these come into full bloom as quickly as the sorts

planted from roots. It is well to remember, however, that dahlias do not come true from seed, that there is a tendency to revert to semi-double or single forms, and that at best the flowers are often disappointing.

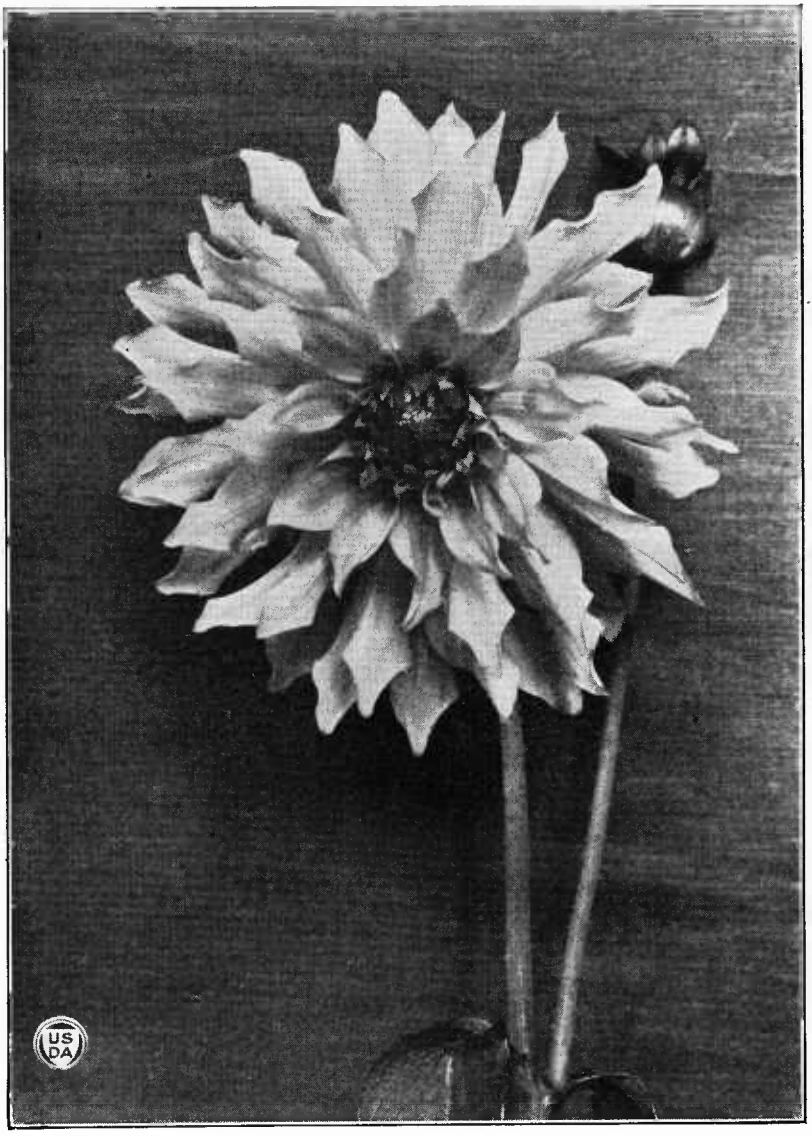

FIG. 5.—Hybrid cactus dahlia, Attraction.

## CUTTINGS.

Growing plants, especially of the new and rarer sorts and also of varieties which do not multiply freely by division of roots, are commonly supplied by the trade. These are raised from cuttings. This

is work for the commercial grower rather than the amateur, as it involves more equipment than the amateur commonly has at his disposal.

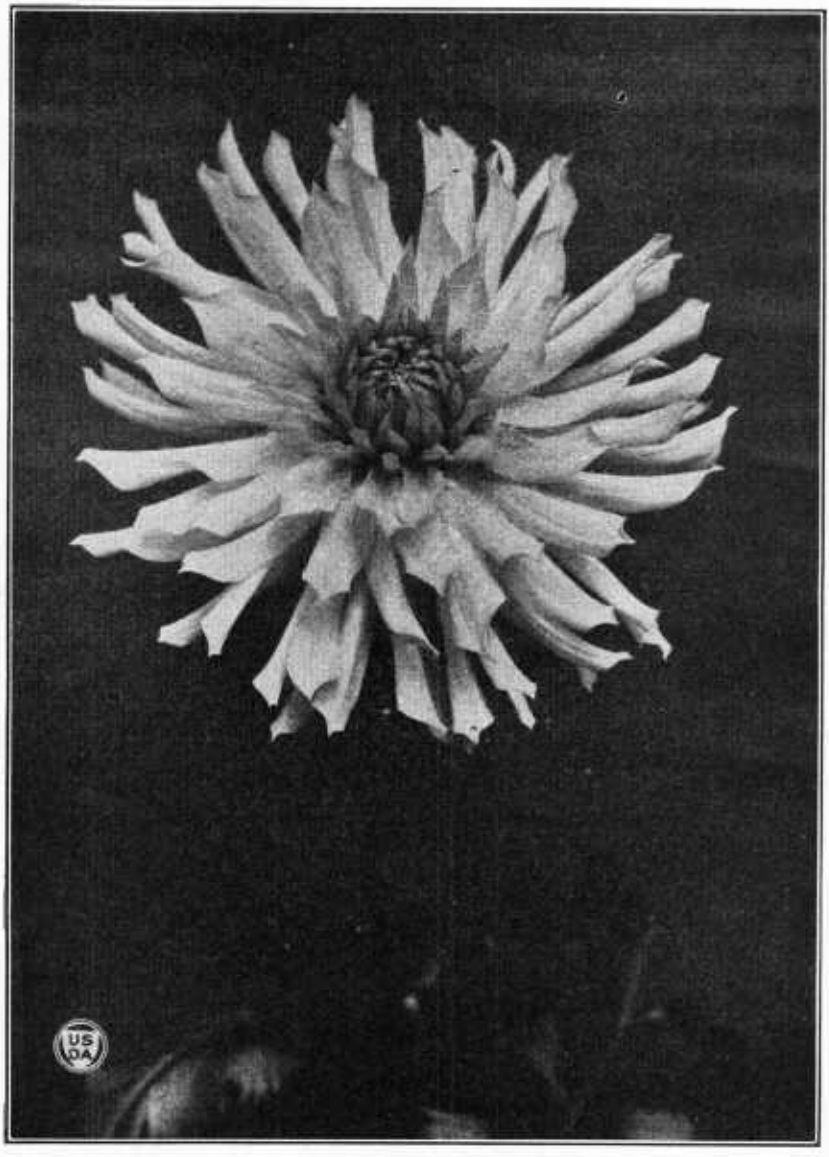

FIG. 6.—Hybrid cactus dahlia, Mrs. Warnaar.

The dormant roots are planted closely in a greenhouse bench in January, and when the young shoots have reached 4 to 6 inches in length they are cut off for cuttings. They are cut between the first and second pairs of leaves, so that new shoots will spring up to take

their place. These, in turn, may be cut off and made into cuttings, but they do not have the vigor of the first set.

The cuttings are prepared for the propagating frame by cutting off the two lower leaves and the stem just below the node (fig. 11).

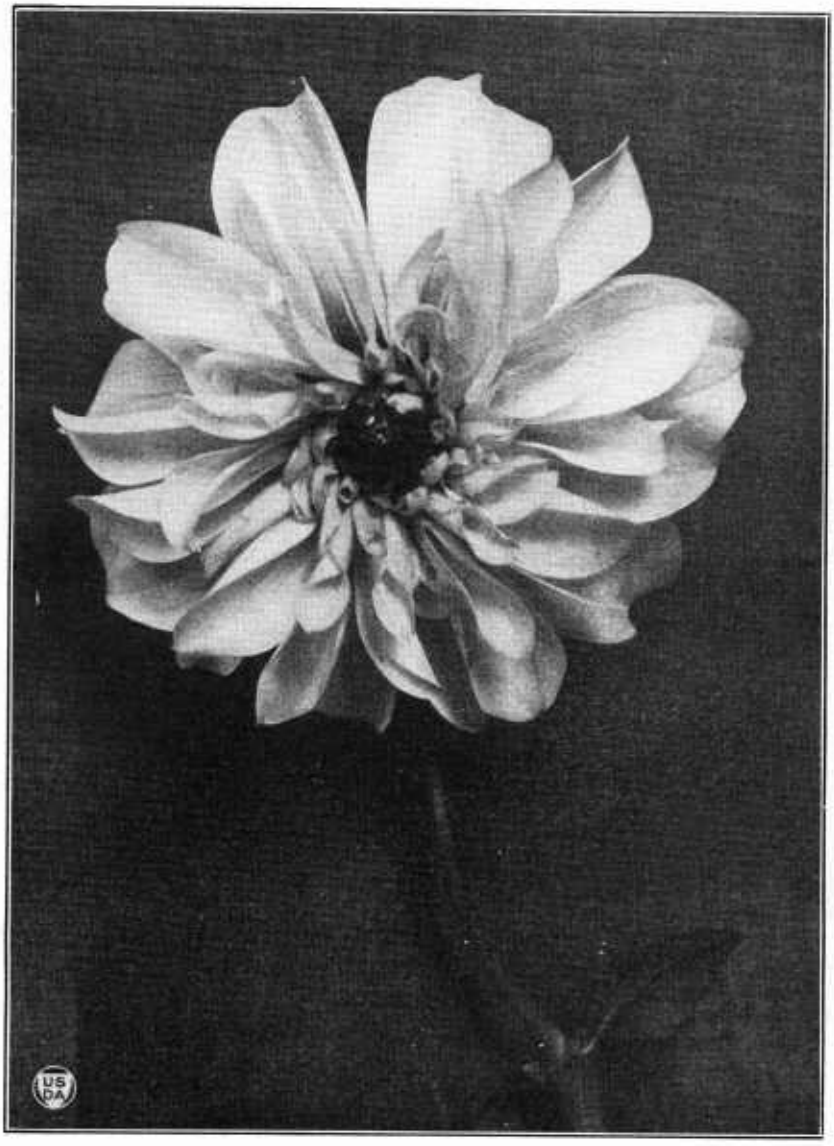

FIG. 7.—Peony dahlia, Queen Wilhelmina.

These are rooted in pure sand, keeping the plants shaded, well ventilated, and in a temperature of 50° to 60° F., with a slightly higher bottom heat for the best results. As the cuttings root, they should be potted in sandy loam and grown in a cool house, transplanting to larger pots as needed until it is safe to plant them out.

### DIVISION OF ROOTS.

The clumps of roots should be started into growth so that the location of all the eyes can be seen. This can be accomplished by putting them in a warm moist place without soil for a short time. As soon as growth appears, the clumps can be cut apart with a sharp knife in such a way that a piece of the stem with the budding eyes

FIG. 8.—Collarette dahlia, Maurice Rivoire.

is attached to each root (fig. 12). This is important, as a root without it will not grow, since it can not produce growing shoots from itself.

If the dahlia makes roots of excessive size many growers recommend cutting off part of the individual root, because there is no benefit to the young plant if the root is too large, and there is greater advantage in having roots of uniform smaller size.

As with any other plant, there are certain dangers in overpropagation of the dahlia. For this reason it is never advisable to take more than two sets of cuttings from a root, as the shoots following those first taken rarely make vigorous plants. The following season these plants propagated from cuttings should not be used as stock to produce new cuttings, but the roots should be divided moderately.

FIG. 9.—Anemone-flowered dahlia, Meissonier.

The result of overpropagation is stock of poor vitality, producing plants of little vigor and flowers few in number and of poor quality.

## CULTIVATION.

Dahlias are commonly grown in masses by themselves rather than singly in garden beds of mixed flowers. There is no reason why they should not be grown as specimens in the border, save that the facility

with which they can be handled in beds by themselves or in rows in the vegetable garden has made that the usual practice. Moreover, dahlias respond best to open culture with abundant air and sunlight. They should not be subjected, however, to high winds, which break the stiff canes and beat the heavy blooms about.

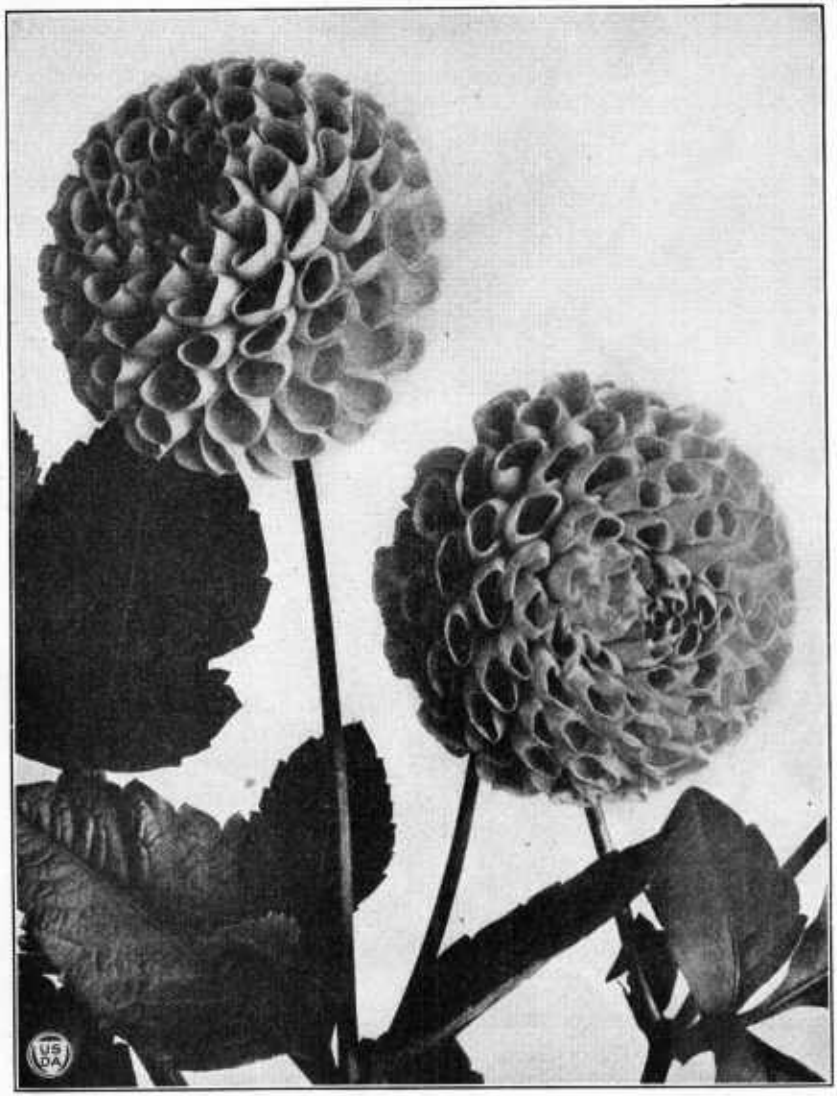

FIG. 10.—Show dahlia, A. D. Livoni.

Dahlias can be raised in almost any kind of soil, provided they are given the food they need. They are tolerant of many kinds of soils and grow in many situations. The soil should be well drained, however, and should approximate what is known as good garden soil. Such a soil is rich in plant food and of a light and friable

texture, conditions existing naturally in some localities, but usually attained by good cultural practices of fertilization and tillage through many years. In poor soil the plants are stunted, while in soil which is too rich they produce too much growth with a minimum of flowers. For these reasons the cultivator must apply fertilizers with care.

Most growers prefer to plant in garden soil of the type described without recourse to additional fertilizers until late summer. In the vicinity of Washington, D. C., a mulch of strawy manure is applied in mid-August, which cools the soil and furnishes extra food to the plants. In addition, a fertilizer rich in potash may be added if the plants show any sign of stopping growth. It is essential, however, that there should never be an excess of stimulation, as the result is always an increase of leaves and not of flowers.

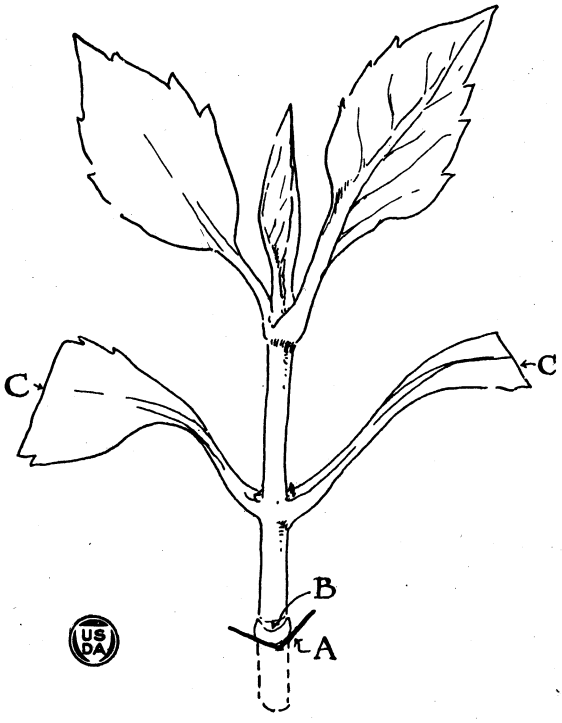


FIG. 11.—A young shoot prepared for propagation as a cutting, cut just below the node (*A*), the lower pair of leaves removed (*B*), and the next pair (*C*) trimmed in order to curtail the evaporating surface.

### PLANTING.

Dormant roots can be planted as soon as all danger of frost is past, and green plants somewhat later. Dormant stock is sometimes held for planting until June without any difficulty except that of continued storage. Late planting is absolutely necessary in the South, because unless delayed in growth the plants would reach maturity in midsummer; the stems would harden up, and the growth become so stunted that few if any flowers would result.

After preparing the soil as directed, the roots should be set in the field in rows 3 to 4 feet apart and as far apart in the row as is desired. If the plants are arranged so that they do not come opposite each other in the rows, but are staggered, some space is saved. Plants spaced equidistantly in this way or in a rectangular plan produce finer specimens than those crowded in the row, and when so planted can be given extra food and care with resulting flowers of finer size and quality. The root should be laid on its side (fig. 13), with the growing shoot nearest the stake. This stake should be set

in place at planting time, in order that no damage may be done to the new roots late in the season and that the young plant may have the support of the stake from its earliest development.

The plants should be kept well and deeply cultivated until blooming commences. After that ordinary tillage is sufficient. This treatment is better than any amount of water, as it produces normal rather than sappy growth.

If the clump of roots has been skillfully cut apart there will be but a single shoot, but if other shoots appear they should be removed, in order to throw all the strength of the plant into the main stem. Practice varies somewhat in the training of young dahlias. Some growers remove the top of the single shoot at once to induce the formation of several stems and a dense bushy habit; others prefer to let the shoot develop naturally to its terminal flower, which they

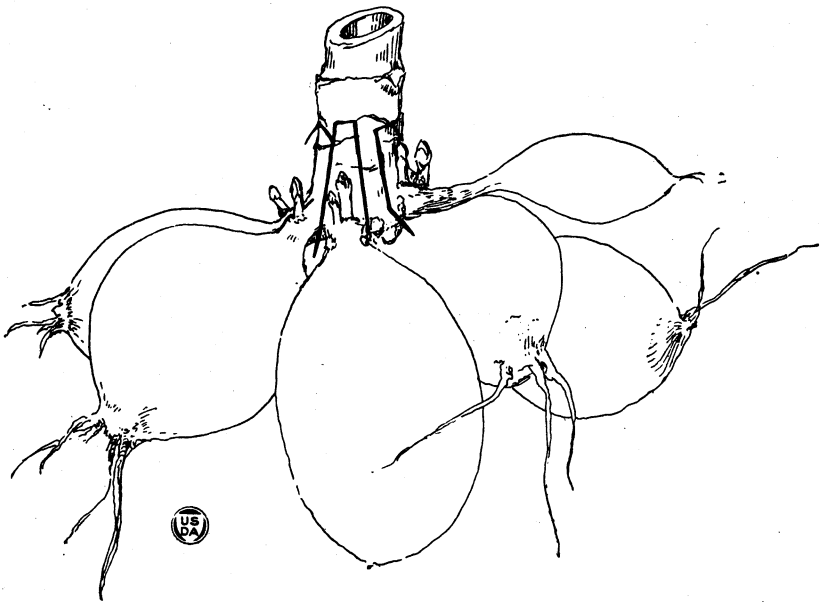

FIG. 12.—A clump of dahlia roots marked for divsion.

cut with a long stem. If branching has not commenced naturally before this cut, it is immediatelv induced. The chief advantage of this practice is that this first flower, if produced in good season, is often the best flower produced by the plant.

As the plant develops it should be tied to the stake with some material soft enough not to cut the tender stem, securing both the main stem and the side branches. Experience alone will guide the grower in determining the best number of side shoots to leave in each variety. By late summer the plant should have reached almost its full development and may begin to show flowers. If permitted to develop they often give blooms of fair size, but rarely of as large size or as good quality as those produced later in cooler weather. For this reason it pays to remove all the early buds until the approach of cooler weather, the end of August in the Middle Atlantic States, from which time they may be permitted to develop normally.

A certain amount of disbudding can be practiced to bring about extra-large blooms, as for chrysanthemums. These flowers are often

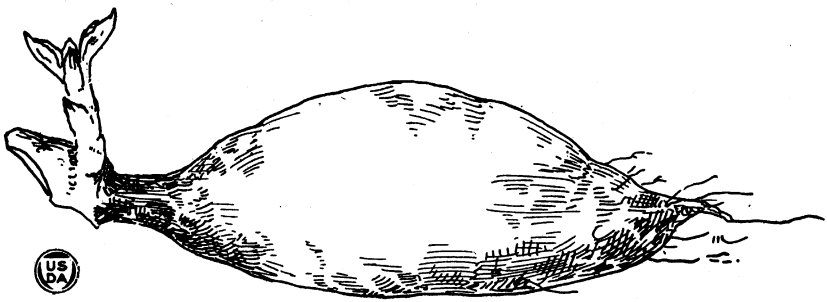

FIG. 13.—Division of dahlia root, showing the proper position for planting.

of enormous size and are more striking for exhibition than for garden decoration. Where blossoms with 2-foot stems and monstrous flowers are not required or needed disbudding is not necessary. Disbudding will not reduce the ultimate flowering, as it causes growths to break out from lower joints on the stalks.

On the dahlia shoot the terminal flower bud is the first to develop. If all the conditions of growth and weather are perfect it makes the finest flower. The other flowers are produced on shoots from the axils of the leaves, which are paired. The accompanying diagrammatic illustration of part of a dahlia plant (fig. 14) shows the customary way of disbudding in order to obtain a fair number of flowers of fine quality with long stems. The practice in disbudding varies somewhat. Very good flowers can be raised when the three pairs of flower buds below each terminal bud are removed, but further disbudding will concentrate more strength in the terminal flower and give longer stems for cutting.

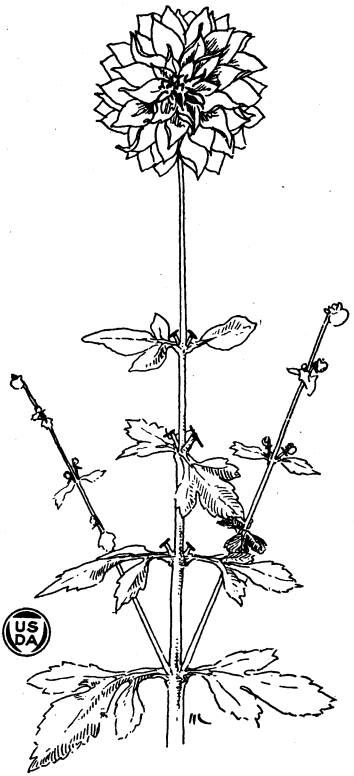

FIG. 14.—Diagram showing the usual method of disbudding a dahlia plant.

## STORING.

The one really difficult phase of dahlia culture is the successful storage of the dormant roots.

As soon as the tops are killed by frost the plants should be lifted and the tops cut off about 8 to 12 inches above the crown (fig. 15). The tubers should be allowed to dry in the air for a few hours and then stored in a frost-free cellar that is

not too dry. This seems simple enough, but only experience can make one sure of the result. If the cellar is too warm or too dry, a common difficulty, the roots can be stored in barrels filled with dry sand or sawdust. Care must be taken that the storage material is perfectly dry, as otherwise rot will set in and damage the entire

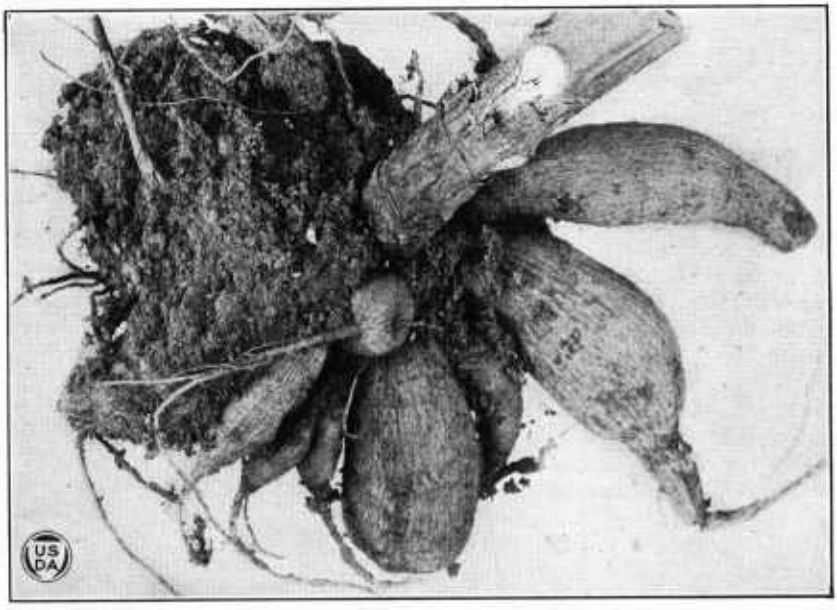

FIG. 15.—Dahlia clump dug for storage.

mass. On the other hand, there is a degree of dryness which must be avoided, as it causes the roots to shrivel and makes starting difficult the following spring. Again, the greatest care must be exercised that none of the roots for storage are injured in any way, as the decay which starts in a wound caused in digging will soon spread to healthy roots, often causing a total loss.

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October 23, 1923.

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